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## A TOP COVER SUPPORTING STRUCTURE OF A WASHER

### [Technical Field]

The present invention relates to drum type washing machines, and more particularly, to a top cover supporting structure for covering a top of a drum type washing machine.

### [Background Art]

In general, a washing machine uses a motor as a main motive power, for performing steps of washing, rinsing, and spinning to remove dirt from clothes by using actions of detergent and water, and is provided with a motor which a motive power unit, a mechanical unit for transmission of energy to laundry, a control unit for controlling a washing process, and a water supply unit, and a drain unit for supplying and draining water to/from the washing machine.

In the washing machines, there are drum type, agitator type, and pulsator type washing machines.

The agitator type washing machine rotates a wing shaped agitator upstanding from a bottom of a center of a washing tub in left/right directions for washing, and the pulsator type washing machine rotates a disc shaped pulsator to form a water circulation, for washing.

The drum type washing machine makes washing by introducing water, detergent and laundry in a drum having a plurality of lifters, and rotating a horizontal shaft slowly, to wash the laundry with an impact of lifting/dropping the laundry. Owing to advantages of almost of no damage to the laundry and consumption of small amount of water, it is recent trend that use of the drum type washing machine increases.

FIG. 1 illustrates a perspective view of a related art drum type washing machine, with a control panel removed therefrom, to show seating of a top cover.

Referring to FIG. 1, the related art drum type washing machine 10 is provided with a front cover 11 which forms a front portion thereof, a door 12 mounted on a center of the

front cover 11, and a top cover 30 for covering a top side of the front cover 11.

There is a panel frame 20 on the front cover 11 for supporting a control panel (not shown). The panel frame 20 is joined with a front portion of the top cover 30.

5 In the meantime, the top cover 30 has edges insert injection molded with a cover frame 31.

The cover frame 31 has at least one supporting rib 32 of a predetermined length projected from a front surface for supporting the top cover 30 joined with the cover frame 31 with the panel frame 20.

10 In the meantime, there is a rib inserting hole 21 at an upper portion of the panel frame 20 for inserting the supporting rib.

With above structure, as the supporting rib 32 on the front portion of the cover frame 31 joined with the top cover 30 is inserted in the rib inserting hole 21 in the panel frame 20, the top cover 30 and the panel frame 20 are assembled.

15 Thus, in a case the cover frame 31 is joined with the top cover 30 by insert injection molding, supporting members, like the supporting rib 32, can be formed on the top cover 30.

However, it is required to vary structure and material of the top cover, taking senses of material of users into account, wherein there are cases when application of a related art joining method between the top cover and the panel frame is difficult in  
20 changing the structure and material of the top cover.

That is, different from the related art in which the cover frame to be insert injection molded is provided separately, in a case enamel is applied to the top cover as a top cover having no separate cover frame, the supporting rib can not be formed in the front portion of the top cover in view of a material characteristic of enamel.

25 **[Disclosure]**

**[Technical Problem]**

An object of the present invention, suggested to solve above problem, is to provide a drum type washing machine in which a new supporting structure is provided that can

support, not only the related art top cover, but also a top cover of an enamel type which can not have a structure like the injection molded rib at one side surface thereof.

**[Technical Solution]**

5 In one aspect of the present invention for achieving the object of the present invention, a drum type washing machine includes a front cover on a front of the washing machine, a door on a center of a front of the front cover, side covers each for protecting a side of the washing machine, a back cover for protecting a rear of the washing machine, a top cover for protecting a top side of the washing machine, and a vertical panel frame on an upper portion of the front cover, having at least one supporting means for  
10 supporting the top cover.

The supporting means is a bead on the upper portion of the panel frame, the bead recessed backward.

The bead is formed by a forming process in which a predetermined area of an upper portion of the panel frame is incised horizontally at a predetermined length, and  
15 applying a pressure from front to rear.

The top cover includes a bead seating part for seating the top cover on the bead.

Preferably, the bead seating part is formed by bending a bottom edge of the top cover at a right angle inwardly with respect to a panel frame surface.

Preferably, the top cover includes enamel coated on a surface of a base metal.

20 In the meantime, in a second aspect of the present invention for achieving the object of the present invention, a drum type washing machine includes a control panel for operation of the washing machine and displaying a state of washing, a panel frame at a rear of the control panel, at least one top cover supporting member mounted on the panel frame, and a top cover supported on the top cover supporting member.

25 The top cover supporting member includes at least one hook for fastening to the front panel.

Preferably, the hook is formed at an upper front edge of a body of the top cover supporting member.

The panel frame includes a hook fastening slot for mounting the top cover supporting member.

The hook has a 'C' section, so that the hook can be fastened to the hook fastening slot in a state the hook is in close contact with an upper, and a lower surfaces of the hook fastening slot.

The top cover supporting member may be formed of polyacetal.

Preferably, the top cover includes a base metal having enamel coated on a surface thereof.

In the meantime, in a third aspect of the present invention, a drum type washing machine includes a front cover on a front of the washing machine, a door on a center of a front of the front cover, side covers each for protecting a side of the washing machine, a back cover for protecting a rear of the washing machine, a top cover for protecting a top side of the washing machine, and a backwardly recessed bead on an upper portion of a vertical panel frame on an upper portion of the front cover, for supporting the top cover, and at least one top cover supporting member on the panel frame for supporting the top cover together with the bead.

The bead is formed by a forming process in which a predetermined area of an upper portion of the panel frame is incised horizontally at a predetermined length, and applying a pressure from front to rear.

The top cover supporting member includes at least one hook for fastening to the front panel, and the panel frame includes a hook fastening slot for securing the hook thereto.

Preferably, the top cover is placed, and supported on an upper surface of the top cover supporting member.

The hook has a 'C' section, so that the hook can be fastened to the hook fastening slot in a state the hook is in close contact with an upper, and a lower surfaces of the hook fastening slot.

The top cover supporting member may be formed of polyacetal.

Preferably, the top cover includes a base metal having enamel coated on a surface thereof.

Thus, the top cover supporting structure of a washing machine of the present invention can support, not only a top cover of a type having an injection molded supporting rib, but also a top cover of a type unable to have the injection molded supporting rub, and having enamel coated on a base metal, safely.

#### **[Advantageous Effects]**

The top cover supporting structure of a washing machine of the present invention permits safe mounting of the enamel type top cover where a structure like a supporting rib can not be formed on an edge thereof.

Moreover, the top cover supporting structure of a washing machine of the present invention permits to prevent cracking of the top cover due to sagging.

#### **[Description of Drawings]**

FIG. 1 illustrates a perspective view of a related art drum type washing machine, with a control panel removed therefrom, to show seating of a top cover;

FIG. 2 illustrates a perspective view of an exterior of a drum type washing machine having a top cover supporting structure in accordance with an inventive step of the present invention applied thereto;

FIG. 3 illustrates a bottom perspective view of a top cover supporting structure in accordance with a first preferred embodiment of the present invention;

FIG. 4 illustrates a bottom perspective view of a top cover supporting structure in accordance with a second preferred embodiment of the present invention;

FIG. 5 illustrates a perspective view of the top cover supporting structure in FIG. 4; and

FIG. 6 illustrates a section across a line I-I in FIG. 4 showing a state a top cover supporting member is mounted on a panel frame.

#### **[Best Mode]**

Embodiments of the present invention will be described in detail, with reference to

the attached drawings. However, the present invention is not limited by the following embodiments, and it is apparent that other embodiments can be suggested which can be included to HHHH, by addition another element, change, or removal of element.

FIG. 2 illustrates a perspective view of an exterior of a drum type washing machine having a top cover supporting structure in accordance with an inventive step of the present invention applied thereto.

Referring to FIG. 2, the drum type washing machine 100 of the present invention includes a front cover 110, a door 140 on a center of a front of the front cover 110, side covers 120 each for protecting a side of the washing machine 100, a back cover 170 for protecting a rear of the washing machine 100, and a top cover 130 mounted on a top side of the washing machine 100.

On an upper side of the front cover 110, there is a control panel 150 having a display unit 151, and one side a detergent box 160 is to be inserted therein.

On a back side of the control panel 150, there is a vertical metal panel frame 200 (see FIG. 3) for supporting the control panel 150 and the top cover 130.

Between the panel frame 200 and the control panel 150, there are various electric components (not shown) placed therein for controlling operation of the washing machine. Operation states of the washing machine provided by the electric components are displayed on the display unit 151.

In the meantime, the operation of the drum type washing machine is identical to the related art drum type washing machine, of which description will be omitted.

FIG. 3 illustrates a bottom perspective view of a top cover supporting structure in accordance with a first preferred embodiment of the present invention.

Referring to FIG. 3, the top cover supporting structure includes a top cover 130, and a panel frame 200 having beads, for supporting a front portion of the top cover 130.

In more detail, the panel frame 200 includes at least one bead 210 projected backward for placing the top cover 130 thereon.

The bead 210 is formed by forming process in which a predetermined area of an

upper portion of the panel frame 200 is incised horizontally at a predetermined length, and applying a pressure from front to rear.

On the other hand, the top cover 130 has a bead seating part 131 formed by bending a bottom edge thereof for seating on the bead 210. The top cover 130 has an  
5 enamel coating method applied thereto.

In more detail, in the enamel coating method, vitreous enamel is coated on a surface of a metal plate, such as a steel plate, and subjected to baking at a high temperature, to enhance chemical durability. A base metal the vitreous enamel is coated thereon is mild steel, cast iron, aluminum, stainless steel, or so on. The top cover of the present invention  
10 is fabricated by forming the base metal into a required shape, and coating enamel thereon.

However, the vitreous enamel is susceptible to an external impact, or bending of the base metal. Therefore, since it is impossible to form a structure like the supporting rib at the front portion of the top cover 130, the present invention suggests forming a structure like the bead 210, for seating the top cover 130 on the bead 210.

15 A second preferred embodiment of the present invention will be described, with reference to FIGS. 4 to 6.

FIG. 4 illustrates a bottom perspective view of a top cover supporting structure in accordance with a second preferred embodiment of the present invention, FIG. 5 illustrates a perspective view of the top cover supporting structure in FIG. 4, and FIG. 6 illustrates a  
20 section across a line I-I in FIG. 4 showing a state a top cover supporting member is mounted on a panel frame.

Referring to FIG. 4, the top cover supporting structure includes a top cover 130 having enamel coated thereon, a panel frame 200 for supporting a front portion of the top cover 130, and at least one top cover supporting member 300 on a rear surface of the panel  
25 frame 200 for placing the top cover 130 thereon.

As a base metal of the top cover 130, mild steel, cast iron, aluminum, stainless steel, or so on is used.

In more detail, the top cover supporting member 300 is placed in, and secured to

hook fastening slot 210 (see FIG. 6) in an upper surface of the panel frame 200. The top cover supporting member 300 may be formed by injection molding of a plastic of predetermined strength, preferably, of polyacetal (POM) having good anti-fatigue property, toughness, wear resistance, and so on. In more detail, the POM, an engineering plastic which substitutes metal, is good at a high, or low temperature, and stress-strain characteristics close to metal.

A structure of the top cover supporting member 300, and a process for mounting the top cover supporting member on the panel frame 200 will be described in detail.

Referring to FIG. 5, the top cover supporting member 300 includes a substantially rectangular body 310, and a hook 320 at an upper edge of a front surface of the body 310.

In more detail, the body 310 has a convex portion 340, a ridge with a predetermined curvature, on a front surface, for placing in a concave portion in the panel frame 200, to make the convex portion 340 and the concave portion in contact more tightly.

Moreover, as described before, the hook 320 is at the upper edge of the front surface of the body 310 substantially at middle of the body 310. It is preferable that the hook 320 is formed as one body with the body 310 by injection molding.

Moreover, a top surface of the body 310 serves as a top cover seating surface 330 for seating the top cover 130 thereon. In detail, the top cover seating surface 330 has a width 'a' which can be determined freely according to a size, or weight of the top cover 130.

The hook 320 has a section of a 'C' shape (see FIGS. 5 and 6, in the drawing, the 'C' shape is shown in an opposite direction) stepped from a predetermined portion of an upper front edge of the body 310, with a slope to become the narrower as it goes toward an end the farther. Therefore, once the end of the hook 320 is inserted in hook fastening slot 210, it is difficult of pull out the hook 320 from the slot 210.

Referring to FIG. 6, the hook 320 at the upper side of the top cover supporting member 300 is inserted in the hook fastening slot 210 in the upper portion of the panel frame 200. The convex portion 340 is in close contact with the concave portion in the panel



frame 200.

Accordingly, the top cover supporting member 300 supports a load of the top cover 130, not only from the hook 320, but also from the convex portion 340.

In the meantime, as the top cover 130 is placed on the top cover seating surface 330, sagging of the top cover 130 can be eliminated.

In addition to above structure, if the hook 320 is at a lower front edge of the body 310, and the hook fastening slot for the hook 320 is formed on the panel frame 200, the top cover supporting member can be fastened to the panel frame more rigidly.

Of course, the bead 210 in the first embodiment, and the top cover supporting member 300 of the second embodiment may be applied together.

#### **[Industrial Applicability]**

The top cover supporting structure of a washing machine of the present invention permits safe mounting of the enamel type top cover where a structure like a supporting rib can not be formed on an edge thereof.

Moreover, the top cover supporting structure of a washing machine of the present invention permits to prevent cracking of the top cover due to sagging.